Impact of Long-Term Filter Cigarette Usage on Lung and Larynx Cancer Risk: A Case-Control Study [1, 2]

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ABSTRACT—A case-control study was conducted among 1,034 white male and female hospital patients with histologically proved lung cancer (Kreyberg type I) or larynx cancer. After adjustment for duration of the smoking habit, inhalation, and butt length, relative risks of developing lung or larynx cancer were consistently lower among long-term smokers of filter cigarettes than among smokers of nonfilter cigarettes, irrespective of quantity smoked. Relative risks in all groups declined with increased years of smoking cessation. The observed risk reduction among current smokers of filter cigarettes was consistent with that expected, considering that these persons had smoked the older high-tar nonfilter cigarettes for a large proportion of their lives.—J Natl Cancer Inst 62: 471-477, 1979.

Although cigarette smoking is recognized as the major causative factor of lung and larynx cancer in both men and women (*1*), elimination of cigarette smoking does not at present appear to be a social possibility. Therefore, as Gori (*2*) has pointed out, alternative strategies must be sought as a humane but interim approach to the complex problem of preventing tobacco-related disease. Two such strategies continue to be explored widely: *a*) persuading segments of the population to reduce their consumption of cigarettes or to quit altogether (behavioral), and *b*) modifying the cigarette itself to produce a "less harmful cigarette" (managerial). The effects of both approaches on the risk of developing tobacco-related cancer have been intensively studied for a number of years. In this paper we examine the impact that the less harmful cigarette has thus far had on the risk of developing lung or larynx cancer, and we attempt to predict the future disease patterns that may emerge from continued application of the managerial approach to cancer prevention.

The rationale underlying this assessment is the dose-response effect observed in both prospective and retrospective studies; the greater the exposure (as measured, e.g., by the average number of cigarettes smoked per day or by duration of the smoking habit), the greater the risk of lung or other tobacco-related cancers (*3–6*). Thus as exposure decreases, either by smoking fewer cigarettes or by smoking cigarettes significantly lower in yield of tumorigenic components, a proportionately lower risk of developing tobacco-related cancers should be expected.

In this regard, two major events have occurred over the past 20 years: Consumption of cigarettes with lower tar[6] has increased (*7–10*), and the tumorigenic potential of tar has decreased (*10–12*). Earlier studies have shown that a lower lung and larynx cancer risk exists among long-term smokers of filter cigarettes than among smokers of nonfilter brands (*13–16*). We provide further evidence, encouraging in light of the growing popularity of lower tar cigarettes.

MATERIALS AND METHODS

The data constitute a portion of that collected in an ongoing retrospective study of tobacco-related cancer. With the use of a standard questionnaire, interviews were conducted from 1969 to 1976 in six U.S. cities by personnel who had undergone a detailed and uniform training period at our institute. Approximately one-third of all interviewed patients were at Memorial Hospital, and decreasingly smaller numbers were in various hospitals in Houston, Los Angeles, New York, Birmingham, Miami, and New Orleans. Interviewers visited 93% of the coherent lung and larynx cancer patients admitted to these hospitals.

The numbers of cancer patients and controls are shown in table 1 with their age distributions. There were 684 lung cancer cases and 350 larynx cancer cases. All patients had histopathologic confirmation of diagnosis. For the analysis in this paper, only Kreyberg type I lung cancer (squamous and oat cell types) was considered because this type has been shown to exhibit

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Abbreviations used: LTFS=long-term filter cigarette smoker(s); NFS=nonfilter cigarette smoker(s).

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[6] Total particulate matter (TPM) refers to the material separated from the gaseous portion of cigarette smoke by a Cambridge filter, while "tar" is defined and measured by the U.S. Federal Trade Commission as TPM less moisture and nicotine.

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